

Rugged Optical Atmospheric Humidity Sensor, Phase I

Completed Technology Project (2006 - 2006)



Project Introduction

Trace species measurement on unmanned atmospheric research craft suitable for interplanetary travel is a demanding application for optical sensing techniques. Yet optical techniques offer many advantages including high-precision, fast response, and strong species selectivity. Balloonsonde, kite, unmanned aerial vehicle (UAV), or glider deployment demands that optical sensors meet stringent size, weight and power requirements. Vista Photonics proposes to develop rugged, compact, battery-powered optical sensor technology capable of selectively determining humidity to 10 parts-per-billion (-100

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C frost point). The enabling technology for meeting stringent NASA mission requirements is a new rugged, compact, and lightweight optical path length enhancement cell that recovers the theoretical sensitivity of established high-performance optical absorption detection techniques. The proposed spectrometer will be capable of detecting multiple species while incurring little additional weight or power penalties.

Anticipated Benefits

Potential NASA Commercial Applications: Detection of contaminants in microelectronics and chemical process/feedstock streams. Assurance of occupational safety, environmental monitoring. Noninvasive health monitoring by breath based diagnostics where a specific component indicates a particular pathology. Detection of toxic industrial chemicals in homeland security applications for high-value installations and mass transit.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

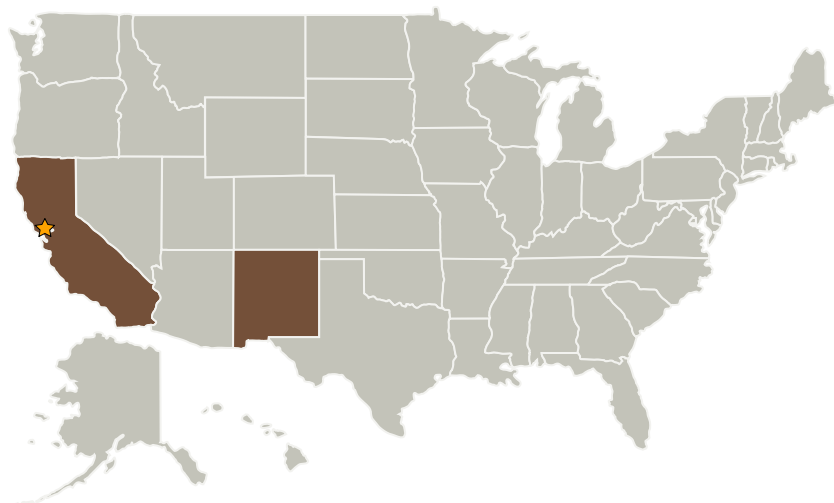
Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Vista Photonics, Inc.	Supporting Organization	Industry	Santa Fe, New Mexico

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jeffrey S Pilgrim

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.3 In-Situ Instruments and Sensors
 - └ TX08.3.4 Environment Sensors

Primary U.S. Work Locations

California	New Mexico
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